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Technological Changes and Implications for Education and Training

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1. Introduction

The speed of technological changes is continuously accelerating. The faster the speed of technological change gets, the greater the changes in learning, and the needs for learning. In addition, the learning is required to be of a higher quality. As learning ability gains in importance, people who are more highly educated have more opportunities than less-educated people. As the speed of technological change is so great, the contents and scope of education have changed. Some nations have focused more on basic and general courses than specific courses.

We studied the relationship between education and technological changes. Specifically, we investigated the adaptation of education to the high speed of technological change. We researched how Korean education policies developed from 1990-2008, which was a period of great technological change. And we surveyed the French education and training system in accordance with the accelerating change in technology.

2. Main Findings

We explained the skill-biased technology change due to 'the endogenous skill biased technology change' hypothesis. It explains skill-biased technological change by focusing on the profit incentive of enterprises. Under this hypothesis, a greater number of higher education graduates is produced as the premium for higher education increases. With more graduates of high education in the labor market, the employers who hire them will be able to generate more profit. Then the use of skill-biased technology will become more broadly popular.

In establishments with high levels of technology, there are more opportunities for highly educated employees than lower-educated employees. This means that there is a complementarity between school years and training. But in

establishments that face a high speed of technological change, there are more opportunities for lower-educated employees than for highly educated employees. This means that there is a substitute between education and training. These results imply that during a period of rapid technological change, highly educated people adapt better to technological changes, and the orientation towards a highly educated society will be a good strategy for gaining competitive power.

In Korea, the technical high school education policy has been developed to adapt to technical progress. The fourth curriculum focused on the learning of the basic sciences and the education of knowledge and theory. The fifth curriculum put an emphasis on the acquisition of common technology and skill, and the study of basic knowledge in order to adapt to the speedy change of technology. But the 5.31 education reform in the 1995 technical high school curriculum policy is focused on the continuing education, and education policy for industry is concentrated on tertiary education, particularly on engineering colleges.

There were also some policies on the engineering colleges, not to divide into specific departments, but to set up cooperation systems between colleges and industry. The mainstream in the college policies was market-oriented. Main policies were school information openings, encouraging Abeek, and evaluation of the contribution of engineering college to industries. But the voice of industry was not a systematic part of the dialogue, so it was impossible to coordinate manpower supply and demand, or to reform the college curriculum. We cannot find any industry representative that has played a leading and positive role in college education.

Since the 1980s, France has made efforts to have 80% of students reach Baccalauréat educational achievement. France has helped its people to adapt to the changes in technology by planning manpower supply and demand, establishing and abolishing degrees and qualifications, administrating the number of students, and evaluating the training curriculums. For example, in ITU, which is the institute for nurturing technicians, the ITU council decides the education curriculum, establishes the majors, and selects the students. There is the same number of representatives for employers and labor in the council. Industry representatives are involved in the various school councils, and in the teaching activities. In France, all academic degrees and qualifications have to be

established after an analysis of the supply and demand of the industry sector.

3. Policy Implications

In Korea, young people usually go to higher education, so the rate of enrollment in universities and colleges nearly approaches 83%. But it is doubtful that the graduates of higher education have the ideal abilities for their academic degrees. Korea has to manage the quality of higher education through the intervention of industry in curriculum setting and teaching.

In Korea, there are no systems to coordinate and match the supply and demand of manpower. There are also no systematic activities to deal with the speed of technological changes. The people in industry who understand the changes in technology have not intervened in the direction and curriculums of higher education. The result has been a huge waste of resources in higher education.

Korea needs to establish institutes for the official and systematic intervention of industry representatives in higher education. Universities and colleges must hand in proposals that include an analysis of planning supply and demand when establishing majors or enlarging quotas. Furthermore, it should be mandatory for industry representatives to be involved in the analysis of planning supply and demand.